

## Original Research Article

# Awareness about mosquito-borne infections among agricultural and horticultural college students: Coimbatore, South India

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## ABSTRACT

**Background:** Mosquito-borne infections especially dengue has created several outbreaks in the present days. Agricultural and horticultural college students are at increased risk of getting infected since they are involved in a lot of field activities. The main aim of our study is to assess the awareness about mosquito-borne infections among agricultural and horticultural students of all the academic years. Also, to analyse the preventive measures and sanitary methods followed by the students to prevent the infection.

**Methods:** This cross-sectional study was conducted in Tamil Nadu Agricultural University (TNAU), Coimbatore including 250 students who are involved in the field works. The questionnaire consisting of 24 multiple choice questions were distributed and collected after filling. The data were processed and statistical significance was calculated using the software SPSS version 20.

**Results:** Females have comparatively good knowledge (54.8%) than males (46.9%). Students whose age is less than 20 years have good knowledge (64%) when compared to students with age more than or equal to 20 years (40.8%). Agricultural students have comparatively fair knowledge (54.5%) than Horticultural students (47.1%). There is a significant association between knowledge and age.

**Conclusions:** The results of our study revealed that the students have fair level of knowledge about mosquito-borne infections especially dengue. Not only creating awareness is important, it should also be looked into that people implement their knowledge into day-to-day practice to prevent the mosquito-borne infections.

**Keywords:** Agricultural students, Mosquito-borne infections, Knowledge

## INTRODUCTION

Mosquito-borne infections are caused by bacteria, viruses or parasites transmitted by mosquitoes. They can transmit disease without being affected themselves. Mosquitoes are regarded as well-known vectors of various diseases which include dengue, chikungunya, malaria, Japanese encephalitis, filariasis, yellow fever, Zika fever etc.,. These mosquitoes breed in all sorts of stagnant water (tyres, drums, coconut shells). Some species can also breed and survive in freshwater bodies. But this development depends on the species, geographic places and temperature. Mosquito-borne infections especially

dengue is being the major concern among the general public in the present days. Nearly 700 million people are affected by mosquito borne illness each year resulting in over one million deaths.<sup>1</sup> Thirty-four percent of dengue infection in worldwide is reported in India. The fatality rate is about 90% among the infected children which is less in adults.

Dengue is an arboviral infection which is transmitted by the mosquito *Aedes aegyptii*. It presents clinically after an incubation period of 3-14 days, as fever of sudden onset with headache, retrobulbar pain, conjunctival injection, joint pain, maculopapular rash and lymphadenopathy.

However, more severe instances can lead to dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS), which could be fatal.<sup>2</sup> The fatality rate is higher in infected children than in adults. The main reason for the incidence is due to lack of awareness, increased urbanization, amplified mosquito population due to inadequate public health infrastructure. Agricultural and Horticultural college students who are involved in field activities are at higher risk for developing the infections. Hence, their knowledge about these infections is significant.

The primary aim of our study is to assess the awareness about mosquito-borne infections among Agricultural and Horticultural college students of all the academic years who are involved in the field activities. Also, to analyze the preventive measures and sanitary methods followed by the students to prevent the infection.

## METHODS

### Study design

Cross-sectional study.

### Study center

Tamil Nadu Agricultural University (TNAU), Coimbatore.

### Sample size

250 students.

### Study period

1 month (1 February 2018 to 2 March 2018).

### Inclusion criteria

Inclusion criteria were Agricultural and Horticultural students of all the academic years who are involved in field activities.

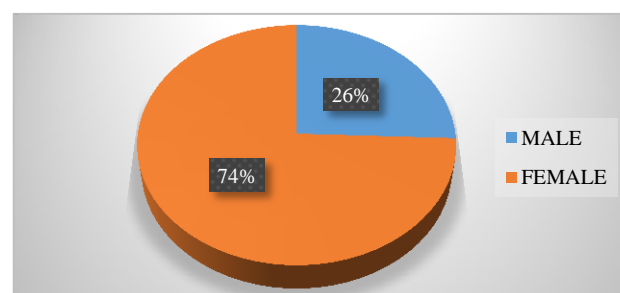
### Exclusion criteria

Exclusion criteria were students who are not involved in field works.

We framed a questionnaire which consists of 24 multiple choice questions, which tests the awareness about mosquito-borne infections among Agricultural and Horticultural students of all the academic years who are

involved in field activities. After getting informed consent from the participants, the questionnaire were distributed and collected after filling immediately. The data obtained were processed and grading of the knowledge was done based on their scores. They were categorized into poor (0-8), average (9-16) and good (17-24). Statistical significance was calculated using the software SPSS version 20 (Chi-square test). The Institutional Human Ethics Committee approval was obtained (No.131/2018).

## RESULTS



**Figure 1: Distribution of students with regard to gender.**



**Figure 2: Comparison of knowledge with regard to gender.**

Our study population consists of 26% males (64/250) and 74% females (186/250) (Figure 1). According to the grading done based on their scores obtained, 1.6% of the males had poor knowledge, 51.6% had average knowledge and 46.9% of them had good knowledge. Among the females, only 0.5% of them had poor knowledge, 44.6% had average knowledge and 54.8% of them had good knowledge (Figure 2). Comparing the overall knowledge with regard to gender, females had comparatively fair knowledge than males. But based on the chi-square value, there is no association between knowledge and gender (Table 1).

**Table 1: Association between knowledge and gender.**

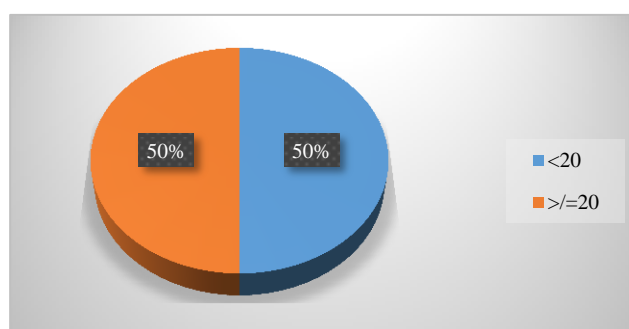
	Males	Females	Total	Chi-square value	P value
Average knowledge	34	84	118	1.19	No association
Good knowledge	30	102	132		
Total	64	186	250		

**Table 2: Association between knowledge and age.**

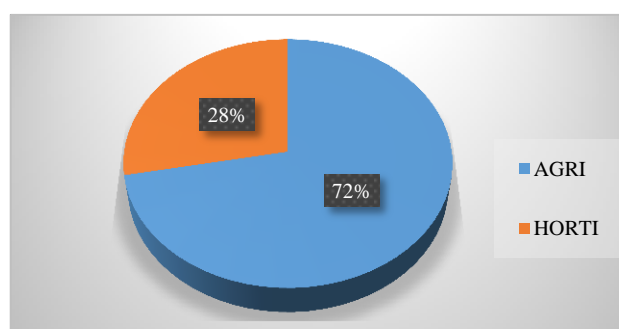
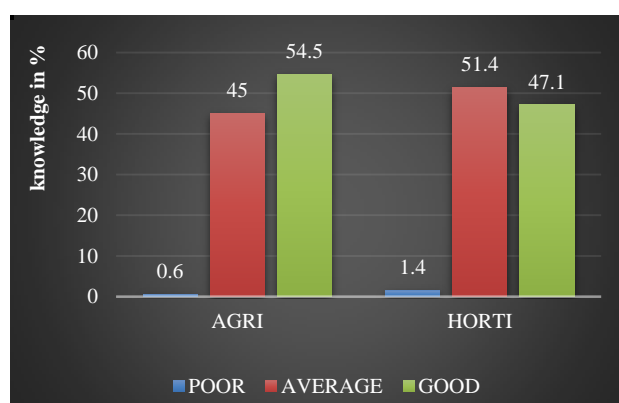
	< 20	≥20	Total	Chi-square value	P value
Average knowledge	45	74	119	13.46	Significant association at p<0.001
Good knowledge	80	51	131		
Total	125	125	250		

**Table 3: Association between knowledge and course.**

	Agri	Horti	Total	Chi-square value	P value
Average knowledge	82	37	119	1.05	No association
Good knowledge	98	33	131		
Total	180	70	250		


**Figure 3: Distribution of students with regard to age.**

The total study populations were divided into two groups based on their age. First group includes students less than 20 years of age (125/250). The second group consists of students whose age is more than or equal to 20 years (125/250) (Figure 3). Based on their scores, 0.8% of students in the first group had poor knowledge, 35.2% of them had average knowledge and 64% had good knowledge. Among the second group students, 0.8% had poor knowledge, 58.4% of them had average knowledge and 40.8% had good knowledge. Comparing the overall knowledge with regard to age, students whose age is less than 20 years had fair knowledge when compared to the students with age more than or equal to 20 years (Figure 4). Chi-square value reveals that there is a significant association between knowledge and age ( $p<0.001$ ) (Table 2).


**Figure 4: Comparison of knowledge with regard to age.**

**Figure 5: Distribution of students with regard to course (n=250).**

**Figure 6: Comparison of knowledge with regard to course.**

Our study population consists of 72% (180/250) Agricultural students and 28% (70/250) Horticultural students (Figure 5). Based on the scores obtained, only 0.6% of the Agricultural students had poor knowledge, 45% of them had average knowledge and 54.5% had good knowledge. Among the Horticultural students, 1.4% had poor knowledge, 51.4% of them had average knowledge and 47.1% had good knowledge. Comparing the overall knowledge with regard to the course, Agricultural students had comparatively fair knowledge than Horticultural students (Figure 6). But the chi-square value shows that there is no association between knowledge and course (Table 3).

## DISCUSSION

Our study intended to assess the knowledge of Agricultural and Horticultural students related to mosquito-borne infections especially dengue. The study population consists of 250 students (26% males; 74% females) of all academic years who are involved in the field activities. The grading of the knowledge was done based on their scores. They were categorized into poor (0-8), average (9-16) and good (17-24). Overall knowledge was good among females than males. Students of age less than 20 years have comparatively fair knowledge than students of age more than or equal to 20. The knowledge was good in agricultural students when compared with Horticultural students. These results are similar to the study conducted previously among the university students by Payghan and Nayyar et al.<sup>3,4</sup>

In case of *Aedes*, 79.2% were collected from the grid chamber, 13.2% from the pumping well and 7.1% from the collecting chambers.<sup>5</sup> The collecting chambers and the grid chambers were part of a non-functional old waste water disposal system, while the pumping well was a functional part of the waste water irrigation system. Irrigated fields were always mosquito negative. This was due to percolation of water through the porous soil, which resulted in the rapid elimination of potential mosquito breeding sites. *Culex* species usually breed profusely in polluted gutters, blocked drains and other water retention habitats with organic matter unlike *Aedes* and *Anopheles* mosquitoes which prefer clean ground pods and man-made containers respectively.<sup>6</sup>

Among 250 students, 68% of them think improper sanitation is the reason for sudden outbreaks of dengue fever. Majority of the students think that it is the responsibility of each and every citizen to keep the surrounding environment clean in order to control the mosquito-borne infections rather than pointing out the Government and NGOs. 80% of them think that there is lack of education and awareness about dengue among general public. In order to prevent the breeding of mosquitoes in the stagnant water which they use for their field works, they have implemented larvivorous fish (*Gambusia*) and mosquito fogging in their campus. Most of the students are aware of the source of mosquito breeding, diurnal variation of mosquito biting, preventive measures and medical helpline. But they are unaware of the mosquito species, diagnostic tests and presenting symptoms of infections.

## CONCLUSION

Since the students are exposed to many field activities, they are at increased risk of getting infected. Hence, their knowledge about these infections is significant. Several outbreaks of dengue in Coimbatore over the past few years show that there is need of awareness campaigns in the community and implementation of proper public health infrastructure. Therefore, not only creating awareness is important, it should also be looked into that people implement their knowledge into day-to-day practice to prevent the mosquito-borne infections.

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